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ABSTRACT

This report describes the state-of-the-art of audio cassette technology (ACT) and reports findings from field tests, case studies, and pilot projects in several countries which demonstrate the potential of audio cassettes as a medium for communicating with rural people. Specific guidance is also offered on how a project can use cassettes as a communication or teaching tool. The changing concept of development is discussed as well as major communication problems in rural development. The problems of rural development and communication are illustrated by the case study of a migrant farmer project in a remote rural area in Pematang Panggang (South Sumatra, Indonesia). Experience is also reported on the use of audio technology with agricultural extension workers in Bangladesh. Additional topics include the characteristics of cassettes that make them so powerful, the content and format used in ACT systems, and distribution systems. Findings from evaluations of the ACT system are summarized, as well as policy implications and research needs. Appendices include a chart of selected rural development cassette projects; a description of cassette projects and simple audio cassette recording equipment, and profiles of the following projects: Assistance to Rural Broadcasting, Afghanistan; Radio Mensaje, Ecuador; the Kipsigis Homesteads Cattle-Dip Management Program, Kenya; and the Pila Project, Guatemala. Sixty-nine references are listed. (LMM)

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Occasional Paper 19

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REACHING OUT:

THE ROLE OF AUDIO CASSETTE COMMUNICATION IN RURAL DEVELOPMENT

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Asian Mass Communication Research and Information Centre

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Reaching Out: The role of Audio Cassette Communication in Rural Development

Communication and development: overview

Rural development programs, whether they originate with the urban-oriented government leadership of a nation, or with an international aid organization, seem more interested these days in the participation of rural people. This may include participation in decision-making, implementation, and evaluation as well as in the benefits of rural development efforts (Cohen and Uphoff, 1977). As Colle (1976) points out, encouraging local people to participate more in determining and controlling their destinies suggests the need to have a better informed and educated population. Villagers long used to being told what to do, or simply isolated from organized programs may need to be motivated to participate, showed how to participate, and know more about their options and opportunities.

A concomitant thrust in rural development programs is to reach people largely overlooked or ignored by those past efforts which stressed economic production. Policies and programs now are more likely to address the need to provide health, nutrition, agriculture and other services to large numbers of hard-to-reach families with modest resources. Frequently this involves innovation and change, and communication plays important roles in these processes.

However, rural development is not something that planners "do" to rural people through communication. Communication is a necessary, but not a sufficient condition of rural development. By itself, communication does not produce development. Development is something rural people themselves do, or it does not happen (Childers and Vajrathon, 1970).

It is often assumed that "good" innovations will sell themselves. The problem is that they do not. According to Rogers (1974), there

are two essential ingredients for development to occur: (1) the appropriate technology, expressed in the form of innovations which are recommended for adoption by change agencies, and (2) the communication about this technology from development agencies to their intended audiences. Most development programs, in Rogers' opinion, often do not use a communication strategy, i.e., a systematic plan or a design for influencing human behavior through the transfer of information and ideas. If communication strategies are used, often they are inappropriate ones. This view is also taken by Colle (1976) who believes it unlikely that rural development programs that involve social change can be effectively implemented widely without conscious and deliberate communication strategies woven into them from the beginning.

It is widely acknowledged that an effective communication strategy usually consists of multi-media approaches, and frequently these incorporate sophisticated high technology as part of an agency's preferred media mix. One needs only to recall the great enthusiasm in recent decades for broadcast-type television as a formal and non-formal education medium. We expect similar enthusiasm for satellite communication. (See, for example, Young and Hurd, 1981.) Yet, there is a growing trend, especially in developing countries' rural development programs, for the use of simple and low-cost communication technology. Radio, for example, seems to have been "rediscovered." Note also the growing enthusiasm for audio cassette technology (Colle, 1977; Shingledecker, 1980) and the exploration of a contemporary role for indigenous media and indigenous knowledge systems (Adhikarya, 1975; Mitchell, 1982). The growing popularity of simple and low-cost communication technology is partly due to cost factors, partly because of its operational simplicity, partly because of power and logistical considerations, and partly because of the need to use informational materials that can be patterned to suit local communities' needs.

Rogers and Danziger (1975) also argue that the use of simple and low-cost communication technology is a more appropriate means for attaining development goals, especially the "second dimension" of development which is concerned with an equitable distribution of income and other development benefits. The "big media" of satellite, television, film and computer-assisted instruction usually benefit urban and higher-income groups more than the lower-income and peasant groups, and may contribute to the "communication effects gap" (Rogers and Danziger, 1975; Schramm, 1977). The "gap" hypothesis suggests that attempts at change-oriented communica-

tion tend to widen the gap in "effects" between high and low socio-economic groups (Tichenor and others, 1970). The "little media" of filmstrips, slides, audio-cassettes, etc. (which are based on simple and low-cost communication technology), however, have a particular potential for closing this communication effects gap, and thus for contributing toward the "second dimension" of development.

This paper is based on several assumptions. First, major social changes often depend on scores of individually made decisions. Second, there is enough margin for change within existing socio-political structures to enable people to better cope with problems of daily existence. For example, we would argue against the dogma that fundamental changes in power must occur before development takes place. And third, we assume that better communication can significantly help poor villagers around the developing world improve their lives by providing them with information and skills on how to use available and accessible resources.

Our focus is on audio cassette technology and its role as a communication medium. In the pages which follow, we describe the state of the art of audio cassette technology (ACT) which is one of the most promising "little media" for use in rural development programs in developing countries. We report findings from field tests, case-studies, and pilot projects in several countries which demonstrate the potential of audio cassettes as a medium for communicating with rural people. And we provide specific guidance on how a project can use cassettes as a communication or teaching tool. But first, we need to examine some further dimensions of development and communication.

Changing Concept of Development

The development decade of the 1970s has shifted its development focus from the old paradigm of capital intensive technology, economic growth, and urbanization to an approach concentrating on equitable distribution of development benefits, agricultural improvements, rural services to the poor, greater participation of the majority of the population, and labor-intensive or "appropriate" technology. Rogers (1976) sees development as a widely participatory process of social change in a society, intended to bring both social and material advancement (including greater equality) for the majority of the people through gaining greater control over their environment.

One of the problems of development, especially in the rural Third World, is the unequal distribution of resources, such as income,

education, land, skills, and information, which perpetuates the unequal distribution of development program benefits. In other words, individuals who have greater resources will usually benefit more from innovations introduced by development agencies than those who have fewer resources.

Attempts to improve the overall conditions of development by simply increasing the per capita income, the average number of years of education, agriculture yield, etc. — which Rogers (1974a) called the "first dimension of development" — have seldom assisted the people who needed the help most: urban poor and peasant families. Greater gaps between elites and the poor have resulted from simply raising the average levels of income, formal schooling, and agricultural production. This situation has provoked attention to the "second dimension of development": more equitable distribution of incomes, services, education, knowledge and other resources and opportunities (Rogers and Danziger, 1975; Colle, Esman, et al, 1979). This calls for putting the rural poor higher on development planners' priority list, and for strategies which directly benefit peasants.

The "second dimension of development" calls for more attention to the simple, low cost communication technology, or the "little media," for these have the unique ability to reach the most disadvantaged segments of the audience in developing nations at a cost per communication exposure that their governments can more likely afford because of very modest capital costs. In addition, messages can more easily be produced and tailored to serve the disadvantaged and stimulate their participation, and be integrated with conventional interpersonal outreach systems (Rogers and Danziger, 1975; Rogers and Adhikarya, 1979; Colle, 1976; Colle, Terzuola and S. Colle, 1975a).

The past decade has seen not only new paradigms for development but also increasing concern about the role of communication in development programs of the Third World. The concern about communication's role in rural development is not new to this decade. What is new is perhaps the definition of the problem-reaching and improving the lot of the rural poor (McAnany, 1980; Rogers, 1976; Schramm and Lerner, 1976). Given the new focus on the "poor majority," the roles of information and communication had to be reexamined in terms of equity (who benefits from information) and productivity (what impact information has on agricultural productivity, health, income, as well as on knowledge, attitudes, and behavior of rural people). Social and political factors influence the conditions of the rural poor, and the problems cannot be solved by ignoring this reality (McAnany, 1980; Beltran, 1976; Diaz Bordenave, 1975).

Major Communication Problems in Rural Development

Extension agents and communication

In many developing countries, the most common approach to rural development is the extension service, with the extension agents as the main actors in providing services and disseminating useful and practical information on agriculture, health, nutrition, etc. These extension agents are professionally trained people in a specialized development area. They most often work on an interpersonal basis—one-to-one and/or in small groups with the rural population. The rationale for this approach is that there is a large body of practical knowledge available from scientific and technical research which can be extended to the rural people. This approach is based on the assumption that rural people are interested in receiving the new information and that they have the necessary supporting resources or can procure them in order to apply the information in useful activities (Menkerio, 1972).

Most extension service programs in developing countries use the "diffusion of innovation" model as the major communication strategy for rural development activities. In recent years, however, this model has been criticized because its implementation has produced unequal benefits stemming from the unequal distribution of resources (Roling and others, 1976; Beltran, 1976). It is argued that farmers' failure to adopt innovations is more likely due to lack of opportunities rather than their resistance to change. In other words, farmers with more land, more knowledge, and more money, will usually get easier credit, more information, and use the technical innovations more readily and effectively. In many developing countries, development agencies are more likely to provide intensive assistance to a small number of innovative, wealthy, educated and information-seeking farmers, and the result of following this "progressive" or "easy to convince" minority strategy leads to inequitable development. Extension agents select such target groups because they cannot reach all farmers. Though the reasons for following this strategy are based on rationality and efficiency, development agencies might question whether the strategy is desirable, given the position that equitable development should be a major policy objective, along with economic growth (Adhikarya and Rogers, 1978).

Critics have also argued that most innovations are uncritically perceived by development workers as good for the farmers. Thus a diffusion system is triggered to convince the farmers to adopt them

(Rogers, 1976; Diaz Bordenave, 1975). The social and economic consequences of an innovation for the community as a whole have rarely been considered. There is a need, therefore, to question whether the innovation is appropriate to the stage of general development, and whether it is likely to favor some group of farmers at the expense of others, or if it is bound to perpetuate the domination of the majority of farmers by force foreign to their own interests (Beltran, 1976).

Shortage of manpower and lack of resources to hire, train, deploy and supervise field level people of all kinds contribute significantly to the inability of rural development agencies to help rural people and stimulate them to participate systematically in rural reconstruction activities. According to World Bank President, Robert McNamara (1973), the ratio of agricultural agents to farm families in developing countries is about 1:8,000 and there is an equally severe shortage of such people in health, dental, and nutrition fields. In one district in Guatemala, Colle (1976) discovered the ratio of dentists to rural people to be 1:168,700! McNamara reported to his Board of Governors in 1973 that only a small fraction of these limited services is available to the poor farmer and his family. Services tend to be extended to those communities which are near accessible and good roads, and those who are already better off socio-economically.

Another major problem is the very limited amount of time the extension agents can spend with their clients. In India's Intensive Agricultural Development Program, an extension agent was responsible for 1,000 farmers spread out in different villages. Despite the title of the program, it was obviously very difficult for an agent to deal very intensively with a farmer, a group of farmers, or the communities in which the extension agent worked. The effective use of rural development change agents has also been limited by their "alien" status in the communities where they worked, a situation aggravated by the limited amount of time they spend in a community.

Other outreach systems: paraprofessionals

Many rural development programs have neglected the disadvantaged rural population due to (1) the "progressive" or "easy to convince" strategy of extension services or (2) the frustration in working with disadvantaged rural groups who usually consider the extension agents as "outsiders" or "strangers." Several promising new approaches to overcome the above problem have been tried out. One approach is to identify, and then use, the opinion leaders among the

disadvantaged groups to create the leadership initiative for development programs in their own communities.

Another approach is to select change agents from among the disadvantaged groups themselves and train them as paraprofessionals to provide services in health, nutrition and agriculture, particularly in underserved rural areas. Use of paraprofessionals has been stimulated partly by the shortage of regular professional manpower, but also by the realization by development agencies that a cultural gulf exists between the "officials" and the newly significant, low income "client group." Examples of this approach include the use of traditional midwives for family planning programs in Malaysia, Indonesia, Pakistan, and Mexico (Rogers and Solomon, 1975), the Community-Based Family Planning Services program in Thailand (Viravaidya, 1976), and various kinds of paraprofessionals being used throughout the world to provide "front line" health services (Esman, et al., 1981). Properly organized and supported, such local paraprofessionals can provide the vital communication and service link between large impersonal "development programs" and those at the community level who are doing the developing. Unfortunately, the tendency to consider paraprofessionals as cheap labor has resulted in poor supervision and general neglect of this potentially valuable resource. As we will suggest later, communication support services using such low cost technology as audio cassettes can strengthen programs using paraprofessionals.

A variation of these strategies involves (1) using existing local, indigenous organizations or (2) establishing small, local community development organizations. Examples are: the Banjars in Bali, Indonesia (Piet and Piet, n.d.), the Mothers' Clubs in Korea (Kincaid and others, 1975), the cooperatives in the Comilla project in Bangladesh (Rahim, 1976), the Birth Planning Groups in China (Rogers, 1979), and in India, the Small Farmers Development Agency which provides agricultural information and credit only to small farmers.

Still the number of people not served by rural development programs seems to be growing and poverty conditions in some places are not significantly improving. For example, during the period of 1963-1972, the applied nutrition program in India, the largest of the nation's nutrition education programs, reached fewer people than the population growth during the same period (Berg, 1973). In Guatemala, the percentage of persons 0-5 years old suffering from malnutrition increased from 74% to 81% during the ten year period of 1966-1975 (Colle, 1976). And FAO data on Ghana show that its population has

88% of the required dietary energy supply, a situation that remained relatively unchanged between 1975 and 1978 (Mango, 1983).

One-way communication

Another problem encountered in communicating with rural people seems to be the inequality of the communication process between the specialist and the "audiences." This problem is, indeed, the inheritance of the one-way, bullet communication model which assumes that the expert or communicator is the initiator and the audience is the target. Routine use of such terms as "audience" and "target group" reveal this orientation.

The problem was well illustrated by Flavier (1974):

> We went to the barrios with the cards stacked in our favor. We had the position, the economic stability, the political power, prestige, etc. We also unconsciously ended up lecturing the farmers that we had the answers and the barrio people were second-class citizens. Yet in agriculture they definitely knew more than I did. We talk about human reconstruction, but the system we used made the people lesser individuals. Indeed, it was a perpetuation of the pedagogy of the oppressed.

There is considerable evidence which demonstrates that useful development-related information is available and can be generated in the countryside itself (Whyte, 1981). In Bangladesh, for example, we have seen localized agricultural practices which might solve problems of many farmers if they knew about them. The problem is how to capture this indigenous knowledge and integrate it into an overall information system (Mitchell, 1982). Thus, the communication process in rural development must include an opportunity for dialogue so that the relevance of innovations can be explored and the appropriateness of indigenous knowledge adequately assessed.

Need for Localization

Today, many development specialists believe that effective rural development programs depend very much on a high degree of localization which will thus ensure appropriateness and responsiveness of development plans to rural people's needs and opportunities. Recently, for example, the Egyptian Government's State Information Service adopted a policy of decentralization for its information, education and

communication activities related to family planning. It has launched feasibility studies to determine what aspects of its operation (e.g., planning, production, distribution, monitoring-evaluation) can be assigned to governorate-level information centers. Rural development strategies need a decentralized approach which will (a) allow the more general objectives of national or regional plans to be made specific at the local level in response to existing socio-cultural and situational differences; and (b) allow such objectives to be modified or revised in response to feedback from the field (Segesti, 1975). This method implies a great need for manpower and material resources, many of which must be mobilized in the rural sector itself.

Recognizing the need to reach the poorer rural families, development agencies increase the volume of information directed toward the rural areas. However, the materials (content) are often the same used to communicate with the usual clientele. This is one of the reasons why many communication activities aimed at the lower socio-economic (SES) groups fail. Since they have different characteristics (e.g. education, belief systems, communication habits, decision-making patterns, etc.), communication materials not specifically designed for the lower SES groups are not likely to be effective. Even where the central themes may be the same, the message design, treatment, and presentation should be tailored to the group's socio-cultural perceptions and particular economic conditions. For example, even with such relatively small island countries as Vanuatu and the Solomons in the South Pacific, it is possible to discern differentiation of agriculture into subsistence farming, cash cropping, plantation, and cooperatives, each of which demands particular attention in tailoring information efforts.

All too often, messages intended for the rural population are urban flavored, beyond the comprehension of most members of the intended group. Such messages will only benefit a small number of people from the higher SES group, and increase the gap noted earlier. We can avoid the urban and SES bias in message development by concentrating on localizing messages which are relevant to the audience needs. Of central importance in the process of tailoring communication materials is formative evaluation, specifically pretesting prototype materials before they are produced in large quantities. In addition, involving rural families in some aspects of message design and production will help add local flavor.

Overdependance on "broadcasting" approach

One of the characteristics of many development programs is a

heavy dependence on the mass communication channels, especially radio. This is primarily due to the widespread low-cost battery-operated transistor radios in the rural areas. Although radio can reach a large number of people at different locations quickly and at a relatively low cost, one main drawback is its inability to localize messages and tailor messages intended for specific groups (such as the rural poor). Often a country has too few resources—transmitters, personnel—to permit more than one or two national services. Or it may wish to have only one service which it can readily monitor or control. Thus radio message are very general and are designed to reach a wide variety of groups. This is a broad-cast rather than a narrow-cast strategy to reach their audiences.

A narrow-casting approach has been tested in Nepal, Taiwan, Tanzania, Malaysia, Guatemala, the northeastern United States, and elsewhere by using audio-cassettes which contained tailored and localized messages for very specific groups of people (e.g., the rural poor, urban dwellers, civil service personnel, migrant workers, etc.) and the results have been encouraging in terms of cost-effectiveness. The narrow-casting approach using audio cassette technology (ACT) is well suited for the lower SES group for they can often control the communication exposure (when to listen to the tapes) themselves and thus are not dependent on a radio broadcast schedule. For example, we have sometimes witnessed agricultural programs broadcast after farmers have left their homes and radios to go to their fields. Unlike the higher SES group, the rural poor's leisure time is limited. Thus, the opportunity to listen to audio-cassette programs at their convenience may facilitate the communication of tailored information.

The narrow-casting approach is also possible using radio, particularly where local radio transmitters are used. An example is the Basic Village Education project in Guatemala (Academy for Educational Development, 1977).

Neglected use of traditional channels

Most members of lower SES groups are usually more traditional than those in higher SES groups. For the former, researchers have found that effective communication channels include folk media, such as puppet shows, storytellers, folk operas, traditional midwives, traditional gathering places such as markets, mosques, Buddhist temples, teahouses, etc. (Adhikarya, 1975). These are often highly credible and culturally accepted media, and studies in India, Indo-

nesia, the Philippines, Pakistan, and Mexico show their effectiveness in communicating with various populations.

In addition, the presentation of messages seems more effective and credible if they are accompanied by traditional music or other elements familiar to the audiences. The latter includes names and places the local audience can identify with, etc.), as well as traditional conventions in communicating. In the Philippines, **balagtasan** or debate in verse, and **duplo** or couplets, are two very popular traditional art forms.

A Case Study in Transmigration: Communication Problems and Solutions

In the following pages we will illustrate the problems of rural development and communication using as a case study a transmigration project in a remote rural area in Pematang Panggang, South Sumatra, Indonesia.

During 1977 the Directorate General of Transmigration, Ministry of Manpower and Transmigration, with the assistance of the United Nations/Food and Agriculture Organization (FAO) conducted a Pilot Extension Training Program for Transmigration Settlement Schemes in Pematang Panggang. The overall objective of the project was to develop practical guidelines for the introduction of appropriate technology and operational training programs for new transmigration schemes in order to increase farm production and to stimulate community development. The Pematang Panggang transmigration project involved 3,500 families in seven village units operated by village unit managers assisted by extension workers. The transmigrants are landless agricultural workers and under-employed persons from high population density areas such as Java, Bali, and Madura. One of the major components of this project was an extension education program.

We will summarize some of the communication recommendations as outlined in **Guideline Proposals for a Communication Support Component in Transmigration Projects** (Adhikarya, 1978). We have selected the part on the general communication problems related to reaching farmers in the transmigration scheme and one of the communication strategies proposed for overcoming the problems—the use of an audio-cassette technology system.

Here are the excerpts based on the report:

Main Problems Communicating with Farmers

a. Most of the transmigrant farmers work long hours on their land, and in addition, they also work for the World Food Programme. Hence, the difficulty in finding an appropriate time for the extension agents and contact farmer to communicate to the farmers.

b. The farmers are usually very tired after work.

c. Besides the fact that there is little time during the day for the farmers to meet for their Farmers' Group activities, there are also still many farmers who do not want to join the Farmers' Group.

d. Among the active Farmers' Groups, the progress of the groups is uneven: some groups are more progressive and successful than others.

e. Due to the fact that they come from different areas in Java, the farmers use different dialects and have different cultural norms.

f. It is widely felt that the quantity and quality of the extension agents serving the needs of the farmers is inadequate.

g. In general, it is also widely felt by the farmers that there is a strong need to provide recreation and entertainment, especially in the form of traditional or folk performing arts and music from the areas where they came from in order to make them feel at home.

In light of the above mentioned problems, the communication activity should have the following objectives:

a. to provide technical and motivational messages (e.g., on agriculture, nutrition, etc.) to the farmers at an appropriate time without having to disturb their work or to force them to participate in a meeting in tired condition.

b. to provide the information to the farmers according to their level of development and progressiveness as well as to their cultural background and customs.

c. to provide technical and motivational information to the farmers by persons who are perceived by the farmers as experts on the subject matter ("safety credibility"), by persons who are perceived to have "closeness credibility" (e.g., persons whom the farmers know very well, friends, etc.) and by those who have adopted the recommended practice ("testimonial credibility").

d. to provide the information through a communication medium which can convey the messages to the farmers in a simple and attractive way (e.g., by combining the messages with traditional music, or incorporating them in an appealing storytelling format).

In order to achieve the above objectives, one of the communication strategies recommended is the following:

1. That a simple, low-cost communication medium be used to reach the transmigrant farmers who need specific, localized and relevant technical and motivational information which can easily be understood and can also provide some form of entertainment.

2. That an Audio-Cassette Technology (ACT) system should be considered as the communication medium to reach the transmigrant farmers for the purpose mentioned earlier.

Other applications

Throughout the world, project designers and researchers have reached similar conclusions about the appropriateness of audio cassettes to help solve communication problems (Colle, 1977; Shingledecker, 1980). We will discuss several of these in our effort to demonstrate how others can exploit the potential of ACT, but first we will examine the characteristics of cassettes that make them so powerful.

Characteristics of Audio Cassette Communication

1. What is it?

The ACT communication system's most unique feature is the use of audio cassette which measures about 4 inches long, 2½ inches wide

and 3/8 of an inch thick (22 × 12 × 6 cm). Despite its small size, the potential of the audio cassette in bringing about social change may be enormous.

The ACT system is a new kind of communication for millions of rural people who for the first time in their lives have a means of communication in which they can control the where, when, and frequency of exposure. It has been possible with print, but many of these people have not been inclined to, or could not, read to obtain information—especially since the printed materials have often been inappropriately written for them. Other channels such as radio, television, films, and field workers largely dictated to their audiences when and for how long the exposure would take place. Thus, an important element in this ACT system is putting greater control over the communication process into the hands of the "target audiences." Colle (1973a) pointed out that "one of the more exciting developments on the frontiers of communication is not so much the technology per se, but the increasing opportunity it provides (the audience) for greater independence from those creating and sending messages."[1]

The physical characteristics of the ACT system also allow it to be used quite differently from open reel tape systems, including the possibilities of localizing the communication messages and encouranging more local audience participation. These characteristics include its relatively low cost cassettes[2] and inexpensive recorder, the plastic container which protects the tape from various environmental and human hazards, the simplicity of operation,[3] and the small size combined with ruggedness and light weight which makes ACT extremely portable. In addition, the ACT system does not depend on electricity, but can be operated by batteries, or solar energy. The simplicity and low cost of cassette technology has put a new multipurpose communication device within financial range of many, but

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[1] In more developed countries, we see this in the development of television video cassette and video disc systems which are releasng television viewers from the arbitrary scheduling of programs by broadcasting agencies.

[2] A 60 minutes cassette (C-60) costs as little as US$1.00 in some developing countries.

[3] In one test in Pakistan, Roshen (1969) reported that the skill of operating the cassette recorder can be taught even to an illiterate person in about five to eight minutes. In Guatemala, a 16 year old girl with two years of formal education who served as a project assistant learned in three minutes — including changing the batteries!

particularly development agencies such as Extension Services and other outreach agencies.

2. How is it used?

The ACT system has been used in various ways in rural development programs in developing countries. Cassette playback machines[4] have been used as a substitute for radio in rural forums, as supplemental information sources played by field workers in face-to-face contacts with clients, as a supplemental device for training field workers, and as an "at-home" information delivery system for rural dwellers. According to Colle (1975a) this "home" information delivery" is the most significant innovation in communication patterns involving the poor rural farmers and other low income families. In this approach, cassette recorders or playback machines are loaned to rural homes for a specific period of time together with cassettes containing rural development topics. Using various formats such as dialogue, serial dramas, interviews, stories, and talks — and blending them with traditional and popular music, seems to be a welcome variation in the rural families' lives.

While radio has its own advantages such as the ability to reach a large number of people at different locations, quickly, and at a relatively low cost, one of its major drawbacks is its inability to localize messages and tailor messages to meet specific audience group's needs. The ACT system, which is based on a narrow casting, rather than a broad-casting approach, has several advantages over radio, if the purpose of the communication is reaching a specific target (e.g., farmers) groups with a specific set of messages. In the following chart, we have compared radio and cassettes.

Organizing Tape Content

Various kinds of content and formats have been used in ACT systems. Decisions of this sort demand careful analysis of the specific conditions in which listening will take place. The following discussion is based on our direct involvement in projects, and may provide ideas to others designing programs.

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[4] In this article, the term **cassette playback machine** is used interchangeably with **cassette player** or **cassette unit**. Likewise, the word 'cassette' is used interchangeably with 'tape'.

Audio Cassette Technology vs. Radio

Differences

Audio Cassette Technology (ACT) System	Radio
1. Audience can obtain information at any time they wish. Thus, the audience has the control as to when he wants to listen to the information.	1. The timing of the information delivery is determined by the source and not by the audience.
2. Messages can be specific enough to meet the needs of particular audience groups and can be adopted according to the local conditions or peculiarities (localized messages).	2. Messages are usually very general due to the nature of broadcasting which has to reach a large but heterogenous audience (generalized messages).
3. Messages can be listened to repeatedly by the audience until they understand fully the recommended practices.	3. Messages cannot be listened to repeatedly by the audience nor can the farmers control the pace/speed of the message presentation.
4. The messages can contain information or advice from the experts who are trusted and known by the audience (local inputs), as well as from farmers themselves.	4. Local inputs (e.g., the voice of the persons known or trusted by the local audience) are usually not included. Seldom are radio programs designed for a specific audience group.
5. Messages can be combined with traditional music or other forms of entertainment favored by the audience in a particular locality.	5. The traditional music/entertainment combined with the messages are usually those which are nationally popular or favoured, but seldom the types that appeal only to a particular audience grouping (regional, social, cultural, etc.
6. Information transmitted is usually clear and not affected by weather conditions or frequency noise as in the case of radio.	6. Information transmitted can sometimes be unclear, affected by weather conditions, frequency noise or geographic location.
7. There is still a "novelty" element attached to this medium which can lead to spontaneous discussions among audiences which have listened to the information	7. Radio has no more "novelty" element for it is not a new medium anymore for most audiences in developing countries.

Audio Cassette Technology (ACT) System	Radio
and hopefully can facilitate the activities of the audience group.	
8. Cassettes can be stopped so that discussion, problem solving, or other activities can be carried out as part of the program, thus providing a bit of participation.	8. Local participatory activities can be planned, as in the case of the Radio Math project (Searle, *et al*, 1976) but the continuous nature of broadcasting makes it more difficult to have listeners act at their own pace.
9. Cassettes can be easily coordinated with other media such as slides or charts.	9. "Radiovision" experiments in Nigeria have demonstrated that radio and visuals can be combined. It also requires the local listening group to operate at the pace set by the broadcaster. (IIEP, 1967)
10. Cassettes can be previewed by listening group leaders so they can be better prepared to lead the groups. One side of a cassette can be used to train the leaders in how to use the program.	10. Preview of broadcasts is not usually possible. However guides and scripts are sometimes available for leaders.
11. **Feedforward** information (re. audience's specific problems and needs to be used for packaging relevant information) and **feedback** information (re. the reaction and comments of the pre-recorded cassette) from the audience can be recorded on a blank cassette and sent to the "information source" for appropriate action.	11. No provision or practical mechanism for obtaining direct feedback or feedforward information from the audience.

Entertainment

We have generally avoided making cassette programs that contain only talks. Music, drama, and stories make the programs more interesting and increase the chances that tapes will not be erased to be used for other purposes.

Entertainment selections can be separate from the messages or part of it. For example, short dramatizations can quickly and interestingly establish a problem or conflict situation. Possible solutions can be

provided also in dramatizations or through recorded interviews and talks.

Popular or traditional music often appeals to listeners. This is more likely to be useful when listening is done individually, or in a casual (informal) context such as in a family setting, rather than in an organized listening group, or when a field worker plays tapes for individuals. In the latter cases, all those involved may find interludes of music or entertainment too time consuming.

One subject or several

Sometimes we have devoted a cassette program exclusively to one topic, such as how to raise chickens and protect them from Newcastle Disease. At other times several topics have been covered. One factor influencing the decision is: how much time do you need for a topic? In one project we used a ten cassette series to cover family planning, but each tape also included sections dealing with other topics such as safety, food purchasing, mental health, etc. Thus each tape contained episodes on a variety of topics, each carried complete messages, yet there were topical threads that connected all ten tapes in the series.

Participation devices

The listener can be brought into the communication situation in several ways. One simple technique is to review information given by asking questions (on the tape) for listeners to answer. In group sessions, the tape can be stopped while members discuss the questions. In one case where women listened while washing clothes in a public laundering area ("pila") the following continuous sequence was used: (1) two-person dialogue on a health problem, (2) comment on the situation by an expert, (3) summary by an announcer, (4) popular music, (5) music volume lowered for review questions ("do you remember . . ."), (6) music continued while individual listener thinks about answer, (7) music lowered for announcer to give answers, and (8) continuation of music to end.

A variation is for the tape to provide instructions telling listeners how to carry out a task, then someone stops the tape for the group or an individual to carry out the instructions. The task could be a problem-solving discussion, or a manual exercise.

Cassettes can also be used to record someone's questions or comments. These can be turned over to project personnel for action, and/

or they could be used in future programs. This kind of feedback can be useful because it is in the actual language of the listener. However, an agency needs to be well prepared to handle this kind of feedback because processing it can be very time consuming if the volume is large.

Another device for participation that can be instructive, entertaining and participatory is to involve local people in preparation of some of the content. This could range from having local musical groups performing, to organizing information on particular issues, such as local health problems or farming practices. It is also relatively simple and interesting to get elders to talk about early history of the area, or other stories of local significance.

Repetition

Even though repetition is possible by rewinding and replaying cassettes, it is possible to build repetition into the programs themselves. This is especially important because of the aural (and oral) nature of the medium, and the fact that people are often doing other things while listening.

In addition to simply saying the same thing over again, another way to repeat information is to use a short drama or dialogue to make a point, following it with a summary by an authoritative-sounding person. The participation exercises referred to in the previous section also provide repetition.

Modular format

In some situations, persons can listen to tapes for only a short time. This happens, for example, when tapes are played in public places such as the *pila* (where a person may come just to get water), or at a clinic (where the person may be called away to meet with a nurse or doctor), or at a refreshment stand or market place (where only a few minutes are spent making a purchase). In these circumstances, it is desirable to have a series of "modules" on a tape, each ranging from three to six minutes long. While the modules can be related, each carries its own complete message so that a person who listens for only a few moments will have a chance to hear something that might be useful.

Local and syndicated content

One of the major points we have made is that ACT systems offer

unusually good opportunities to "localize" messages and information. This can include local leaders whose names associated with a project would give it credibility; a performance by local school children; names, locations and hours of various public services such as agricultural credit agencies or health clinics; or a testimonial from a local person about an issue such as family planning.

In Bangladesh, an FAO project (BGD/79/034) assisted an agricultural research utilization program in which an audio cassette system is used to package relevant and timely agricultural research findings for **region-specific** (Rajshahi Division) as well as **district-specific** (5 districts in the Rajshahi Division) purpose or use. Such a system is used to (1) disseminate **localized** and relevant (in terms of timeliness and major crop areas) agriculture research findings and recommendations to field agriculture extension workers, and (2) obtain **feedforward information** (i.e. inputs from the agriculture extension workers regarding farmers' problems and information needs) and **feedback information** (regarding the audience's reactions as well as the usefulness and results of the information contained in the prerecorded cassettes which are disseminated on a monthly basis). Cassettes are produced at both the regional and district levels (1 regional production center, and 5 district centers) with inexpensive production facilities (basically consisting of only 2 cassette recorders. See Annex 4).

It may be too much of a responsibility to expect some local operations to produce all of their own tapes. National or regional agencies can produce general material for widespread distribution, but through local offices. Space can be left on the tapes for insertion of local material by these local offices. For example, a Ministry of Agriculture might produce a tape on agricultural credit which includes information on government policy and general guidelines for obtaining and repaying loans. Space can be left on the tape for a local bank or agricultural office (or both) to record messages explaining local procedures. This syndication with local inserts can also help maintain a reasonable quality of taped programs.

Professional and amateur production

The previous section suggests a dilemma often facing project people: how professional-sounding do tapes have to be? Local production and participation do not always result in the quality of programming available on conventional radio broadcasts or on cassettes produced by a national government's information service. While local

Figure 1: Sample of Cassette Content for the Pemetang Panggang Transmigration Project in Indonesia

Cassette I, side A: (on agriculture)		Cassette I, side B: (on nutrition)	
Opening and traditional music	4 minutes	Opening and traditional music	4 minutes
Episode I (motivational) (in form of drama/soap opera	10 minutes	Episode III (problem identification) in form of dialogue of several local farmers)	7 minutes
Episode II (technical information) interview/discussion with local farmers	4 minutes	Traditional entertainment	3 minutes
Traditional entertainment	5 minutes	Episode IV (problem solving) in the form of drama between the farmers and persons with expertise	7 minutes
Summary of recommended message	3 minutes	Traditional entertainment	4 minutes
Traditional entertainment	4 minutes	Summary of recommended messages	5 minutes

Source: Adhikarya (1978)

production may mean a compromise in technical or performance quality, this may be balanced by several advantages: creating community interest because of local participation, the authenticity of local vernaculars, and the credibility provided by familiar names, places and culture. Based on scattered evidence, we guess that local leaders and field workers who play tapes for groups and individuals will give more enthusiastic support to the use of ACT if they themselves have been recorded on tape.

How one organizes the content of a cassette program depends on a variety of factors, and one of the most important is the distribution systems that are used for getting tapes to users. We turn next to this topic.

Distribution Systems

First, we need to summarize some of the most typical listening contexts. These include:

1. Group listening in an informal, unstructured setting such as at

Figure 2 : **Sample of Cassette Content (March, 1983 Regional Edition) of the ACT Pilot Program in Bangladesh (information validity : March 18 – April 30, 1983)**

Side A:		Side B:	
Signature Tune of ACT program	1′	Signature Tune of ACT program	1′
Introduction	1′ 30″	Introduction : On Rice Cultivation (T-Aus & Boro Rice)	1′
Traditional music	30″	Folk music	1′
Monologue: Need for Proper Wheat Seed Storage	1′ 30″	Monologue: Water Management & Plant Protection	1′
Traditional music (cont.)	30″	Traditional music	1′
Monologue: Wheat Harvesting and Drying	1′	Monologue: Suitable Variety for T-Aus	1′
Traditional music (cont.)	30″	Traditional music (cont.)	1′
Drama: Techniques of Wheat Seed Storage	4′	Drama: Land Preparation & Fertilizer Management	2′ 30″
Folk song	3′	Folk music	1′
Summary of Wheat Seed Storage	30″	Monologue: Irrigation Management	1′
Traditional music	30″	Folk music (cont.)	30″
Monologue: On Summer Pulses (Mung Beans and Black Gram)	1′ 30″	Dialogue: First Top Dressing and Weed Control	2′ 30″
Traditional music	30″	Popular music	1′
Monologue: On New Variety of Summer Pulses	1′ 15″	Summary of Rice Cultivation	1′
Traditional music	1′ 30″	Popular music (cont.)	1′
Dialogue: Need for Fertilizer for Summer Pulses and its effects on Soil Fertility	1′ 30″	Drama: Problems of Sulfur & Zinc Deficiency	3′ 30″
Folk song	45″	Folk song	3′
Monologue: Cultural Practices & Fertilizer Management for Summer Pulses	1′	Interview: Symptoms & Remedies for S & Zn Deficiency	3′
Popular music	1′ 30″	Traditional music	1′
Dialogue: Need for Drainage for Summer Pulse	2′	Summary of S & Zn Deficiency	1′
Folk music	2′	Closing Music	1′
Summary of Summer Pulses	1′		
Closing Music	1′		

Source : UNDP/FAO project BGD/79/034

the *pâa*, where people come and go as they wish (Colle, 1977a; Colle, 1979).

2. Group listening in a structured setting, such as groups which meet regularly, with a particular agenda and objective. Examples are the listening groups for farmers in Guatemala (AED, 1977), and for women's groups in Tanzania and the United States (Stanley, 1980; Colle, 1979).

3. Playing of tapes for individuals by project personnel such as extension agents or health workers (Colle, Terzuola, and Colle, 1975).

4. Playing of tapes by individuals, as in the case of people using them independently in their own homes (Colle, Terzuola, and Colle, 1975; Colle 1979; Adhikarya 1978, 1979a).

A very practical issue that confronts officials setting up such ACT systems is how to get tapes to those using them. It is usually less of a problem getting tapes to local agencies than getting them out to individual households and more remote settlements. The normal administrative channels can be used such as those used to distribute documents or supplies. In one African country, cassettes have been dropped to their destinations by airplane. Possibilities that seem worth exploring are public and private transportation systems (boats and buses) that often reach into remote areas, and commercial marketing systems that distribute gum, cigarettes, and beverages throughout the rural countrysides. Public agencies have used these commercial channels for distributing other materials such as contraceptives (Rogers, 1973; McMillan, 1973).

We once proposed a unique information diffusion system for Indonesia that combined satellites, radio and cassettes (Colle, 1976). Information from various national resource centers (e.g., for agriculture, women and children's welfare, language education, or teacher training) would be beamed throughout the vast country via the Palapa communication satellite. At the provincial ground stations, it would be recorded with additions or deletions made to match the needs in each particular province. Then it would be transmitted throughout the province via the area's radio station during non-broadcast hours. In lower geopolitical units, it would be recorded, again with changes made locally to tailor it to local conditions. Then it could be used as part of an organized activity such as the primary education program, or it could be stored in a local center for use when needed by community or project leaders (Colle, 1976).

Pass along system

There are several ways to get cassettes into individual homes or settlements. In some places they could be delivered by outreach workers, or by the mail system; or users could pick them up at a central location such as the local market. We have tried another technique with considerable success. A cassette and tape machine is given to one home on the first day of the week. On the second day the system moves to another household. Again, tape and machine move to a third location on the third day, and so on through the rest of the week. At the start of the second week, a new tape is put through the same cycle. Among the benefits of this technique are: users themselves are responsible for moving the tape from place to place, relieving project people of having to deliver tapes; and the process of exchanging the tapes and recorders is likely to prompt discussion of the topic being presented. A variation of this method is to provide a set of tapes all at once, leave them with users for longer than a day, and have a continuous chain of users rather than putting tapes into cycles of homes.

In some cases, the next household in the chain might be selected by the current user. In other situations it might be designated by the agency. We experimented with both approaches. We made some interesting discoveries in the first one. After the recipients (and their friends) were finished with the cassettes, they selected the next household where the cassettes would go. They were only told to give the material to a household which might like, and might be helped by the cassettes.

The field workers at first were alarmed by this system. They thought the equipment would "go clear out of the territory" and they would never see it again. But almost immediately, they reconsidered. They then thought that probably nothing would be lost because those receiving equipment would be so pleased with being trusted that they would take extreme care about giving the cassette unit and cassettes to a "responsible" user. They were right. They never lost a machine. The only problem with this system was that the materials did not travel as rapidly as planned from household to household. People were urged to pass them along in about two weeks, but many held them longer.

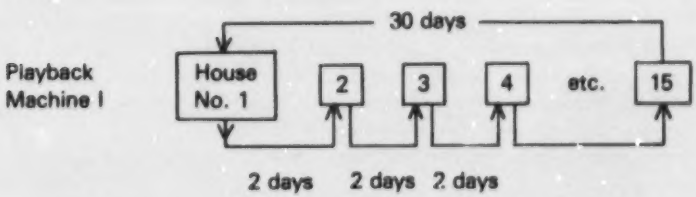
A significant advantage of this approach is that a built-in "testimonial" mechanism is at work. When a person takes the materials to another person, there is more than a delivery taking place: there is an

implicit endorsement of the product, and, hopefully, a matching of the content with people who need it is done — not by an outside agency—but by people within the community.

Which of these methods is used would be influenced by the settlement patterns and density of population (it would be easier to use cycling if homes were close together and travel among them relatively easy) and the nature of content (information that would be best delivered in installments, such as agricultural practices would fit the cycle model, while nutrition information might best be delivered all at once).

For example, in the Indonesian tranamigration project, the physical location of the farmers' houses in Pematang Panggang is an added advantage which facilitated the distribution of the cassettes and the playback machines. The houses are neatly arranged in straight rows with equal distances from each other in every block. Therefore, this pattern supports a distribution system which enables a farmer to pass along the cassettes and the playback machine to his next door neighbor easily after he has listened to the cassettes. For every 15 households, one playback machine was provided and each household was given a maximum of two days to borrow and to listen to the cassettes and the playback machine, before passing it to his next door neighbor. After 30 days all the 15 families had listened to the cassettes and new cassettes were distributed again in the same distribution pattern.

The following is an example of a distribution scheme in Block X:



Bonus audience

In Bangladesh, the FAO (project BGD/79/034) supported ACT pilot program for agricultural research utilization operates in the area covered by the 6 research stations of Bangladesh Agriculture Research Institute (BARI) in the Rajshahi Division (total of 5 districts). The primary target audience are the field agriculture extension workers.

These extension workers are considered "multiplier agents" who are expected to disseminate further the relevant research findings and information to farmers thus creating the needed agriculture research and extension linkage.

For the "**region-specific**" information, there are 3 types of **delivery points**, (1) at the 5 BARI district sub-stations, (2) at the District Extension Officer (DEO)'s offices (district level, and (3) at the Training Units (sub-division level), where prerecorded cassettes of 60 minutes are delivered once a month. These cassettes are produced at the BARI Regional Station (see Figure 3).

For the "**district-specific**" information, since the cassettes are produced at each of the BARI sub-stations, there are only 2 types of **delivery points**: (1) the DEO's offices and (2) the Training Units (see Figure 4).

There are also **feedback points**, located at the DEO's offices, where reactions from the intended audience, as well as results and usefulness of the prerecorded information on the cassettes, are recorded when the field extension workers come for their monthly meeting. In addition, **feedforward information** (regarding the farmers' agricultural problems and information needs) is solicited from these extension workers and recorded during this monthly feedback meeting. The recorded cassettes with the feedback and feedforward information from the extension workers are then sent to the nearest BARI research station to be used as inputs to generate the next edition of cassettes as well as to guide and formulate new and relevant research programs which findings are needed by the farmers.

Whatever the system of distribution, use of cassette programs in a household usually results in reaching more persons than those expected. Inevitably they are played for members of the extended family, and for friends and neighbors. The likelihood is also great that the cassettes will stimulate discussion that might not have otherwise occurred.

Continuous or intermittent distribution

In using a system in which tapes are regularly distributed to homes, schools or other listening places, agencies need to decide whether to produce tapes for continuous distribution (for example one tape per week or month) or withdraw the system periodically. Generally, we favor distributing players and tapes for four to eight weeks and then

Figure 3 – Utilization System for ACT Program for Region–Specific Information

(Illustration only shows 2 out of 6 research stations)

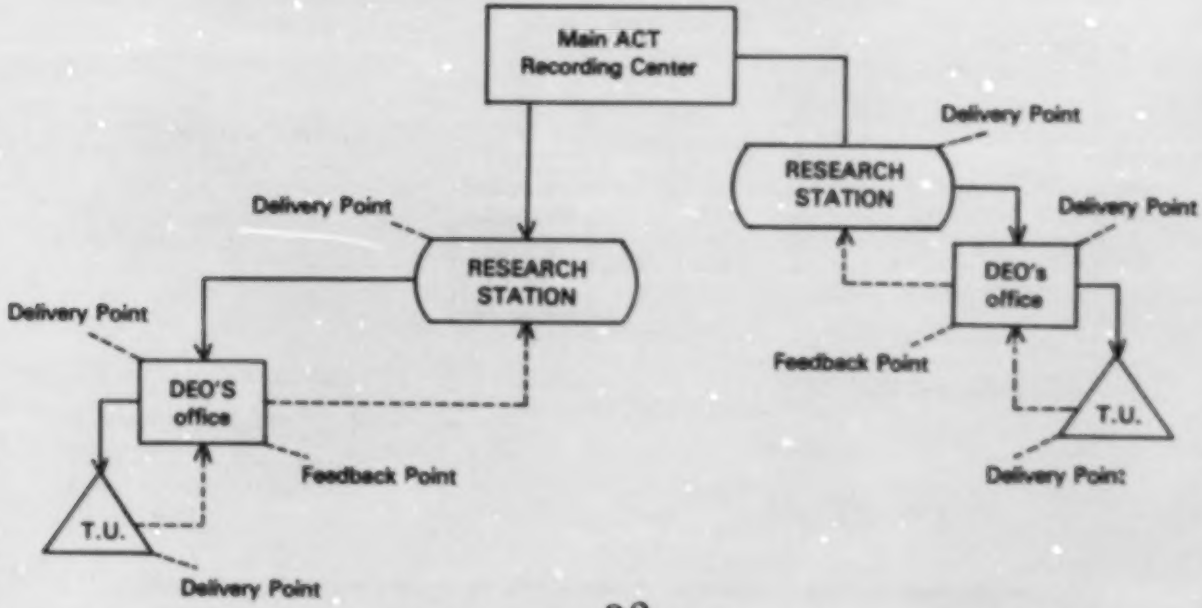
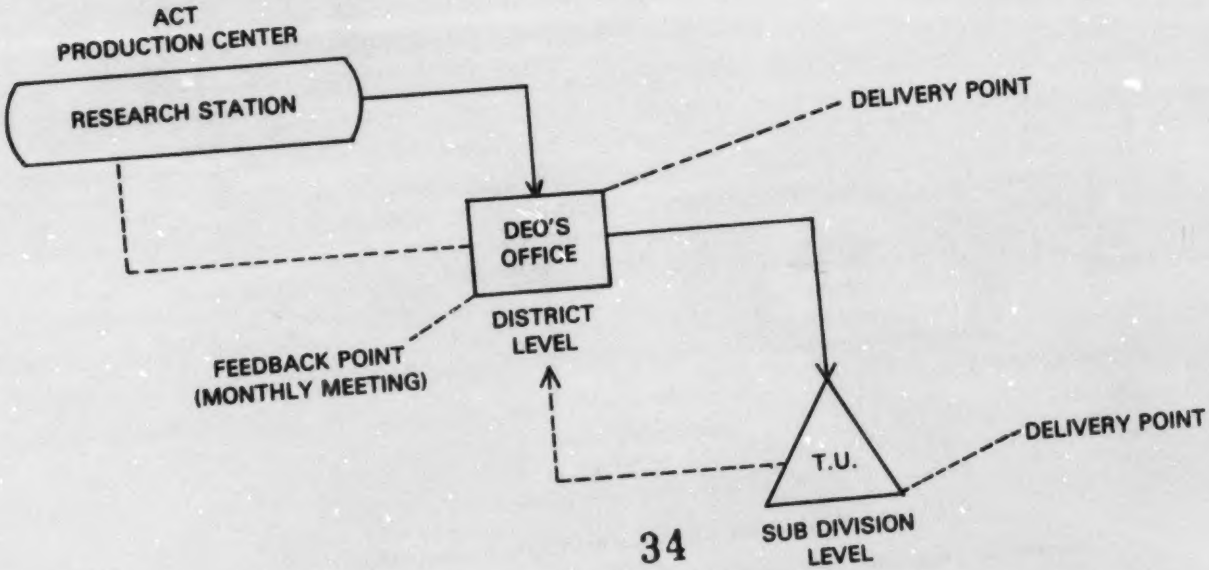


Figure 4 – Utilization System for ACT Program for District–Specific Information



shift them to other locations. Later players with new tapes can be brought back to previously exposed areas. This pattern has several advantages: more people are covered by the system, and the novelty of the system can be preserved longer.

Where a library or community center serves as a checkpoint for tapes, the same intermittent pattern can be used, although it may be better to have them hold the collection permanently.

There is some evidence that the cassette system itself has authority and prestige. People or ideas accrue status because they appear on tape. Stanley (1980) notes that "the technology's prestige never diminished" during a year that cassettes were used in a women's listening forum project in Tanzania. More study will be needed to check the factors that help preserve this status, but we suspect that some planned interruptions in use will prolong the authority and status as well as the novelty of the system.

Evaluation of the ACT System: lessons learned

Most of the evaluation of ACT projects has been more "process evaluation" than an "impact evaluation". Persons working with ACT systems initially were more interested in learning how the system could be established in terms of message production, and delivery system, as well as maintenance and technical durability of the cassette technology. Increasingly, however, the impact on behavior change has been given more attention. Evaluation research focusing on information gained, as well as recall tests, for instance, has been attempted in Afghanistan (Stockley, 1977), Guatemala (Colle, Terzuola, Colle, 1975), and Indonesia (Adhikarya, 1978a). The major problem in conducting impact evaluation seems to be the time factor required to measure change in terms of actual behavior.

Nevertheless, the process evaluation reports, even if the research methodology and/or design is not quite rigorous, are useful in providing us with a better understanding on how the ACT system operates and what its advantages are over other media. The following are some of the findings reported by various sources who have monitored and evaluated the performance of the ACT system.

Audience Control Over Message Exposure

Low income people, it was found, did listen to the cassettes, even

when other media such as radio and television provided competition for their time. These people very often listened more than one time to the cassettes, indicating that there was need to have a medium, such as the ACT system, that would allow for repetition and review. It was also found that since the audience had the opportunity to listen to the cassettes in their own household (or wherever they pleased), it was possible to use quite intimate and personal material such as family planning and venereal disease information (Colle, 1974; Stockley, 1977). In addition, flexibility for listening to the cassette at one's convenience increases the accessibility of the audience to the medium.

Secondary Flow of Information

In almost all of the ACT projects, it was reported that often when a cassette unit was located in one household in the rural village, relatives and friends from outside the household also listened. This provided not only for additional exposure but also the stimulus for spontaneous group discussion of the issues covered. This situation, in some instances, also created certain reinforcement to persons who has to decide to adopt special recommended practices. In both the USA and Guatemala projects, the effects of the ACT system extended beyond those who were loaned the cassette units. When a free recipe book was offered, more than twice as many people requested it as the number of people who were given the cassette with the offer on it (Colle, 1974). A similar situation occurred when plantation dwellers were offered free chicks on a cassette devoted to information on raising chickens (Fernandez and Colle, 1977).

Opening Up Communication Channels

Certain kinds of information such as family planning are difficult to provide in public media (e.g., radio, television) or in face-to-face meetings. Often it is difficult for even a female field worker to introduce the subject to women because of embarrassment over the private details of contraception. However, the impersonal cassette recording played under conditions determined by the listener not only was able to convey much information that the field worker could not have done, but often opened up channels of communication between the field worker and the client. A parallel situation happened when husband and wife listened to the cassettes; a foundation was created for them to talk about a subject that might usually have been avoided (Colle, 1975a).

In another situation, extension agents were frustrated because their

clients took up so much time talking that the agent did not have enough time to give the scheduled instructions. The dilemma was resolved by leaving with the family a cassette tape containing the necessary information which they could play at their convenience. Thus, the agent was able to continue listening to the client during the visits, knowing the tapes would provide the family with the information later (Colle, 1975).

In Afghanistan, where the use of cassettes was complemented by radio, radio was effective in introducing solutions in general, but cassettes were more effective for providing specific solutions and repeating difficult messages.

Benefits for Extension Agents

Colle also found out that in both the U.S. and Guatemala projects, the extension agents or field workers themselves learned from the cassettes (Colle, 1974; Colle, Terzuola and Colle, 1975a). Since some of the information was outside their specialization, they were exposed to new information and knowledge. Stockley (1977) also reported that extension agents in Afghanistan learned as a result of playing cassettes for others.

Projects should anticipate problems in having field personnel use cassettes for delivering information. For example extension agents may feel they are no longer the central attraction and that they might be replaced; and extension agents could easily become bored if they have to listen to the same cassettes over and over. Therefore, it should be pointed out that the ACT system is not a substitute for field workers or extension agents, but rather it is a tool to assist their tasks. The extension agents can place the cassette units in the households and supply the appropriate cassettes and leave. They can return to answer questions, get comments, and accept requests for additional information. And they can participate in the recordings, and be on the tapes that are distributed. Thus, rather than being an imperfect master of one specialty (e.g., agriculture or nutrition, or family planning), field workers or extension agents can be masters of various resources for many topics for their clients (Colle, 1975).

Projects in Guatemala, the U.S., Pakistan, and Indonesia also reported that self images of many extension agents who used the ACT system were changed. Being a carrier of, and having control over, valuable cassette units which can be loaned out to homes seemed to give them added stature. This might be the reason why so many

extension agents were highly enthusiastic and discovered unique ways of extending the coverage of the system. In Guatemala, volunteer agricultural agents reached more farmers than they were supposed to (Colle, Terzuola, Colle, 1975).

All four information-gained tests conducted in Afghanistan, Guatemala, Nepal, and Pakistan had shown a significant increase in information gained when the ACT system was used as a training device for extension agents or field workers (Stockley, 1977; Colle, Terzuola, Colle, 1975; Shaney, 1973; Roshen, 1969).

The assistance of the ACT system to the extension agents also means that the quality control of information dissemination can be improved significantly.

Knowledge Gained and Behavior Change

Evaluation studies on the actual effects of the ACT system on the audience's knowledge gained and behavior change had been conducted in Afghanistan, Guatemala, Nepal and U.S. projects. The evaluation studies, however, were conducted immediately after the communication campaign using ACT, and also the measures were rather weak. In some cases, the research design was not so rigorous as it should have been. However, even with some weaknesses in the evaluation procedures, the results could be used as rough indicators of success or usefulness of the ACT projects.

In projects conducted in Afghanistan, Guatemala and Nepal, the design was an experimental one, using control and treatment groups. The results showed a significant (at the .05 level) increase in the treatment group in terms of knowledge gained in all projects (Stockley, 1977; Shaney, 1973, Colle, Terzuola, Colle, 1975). In the Nepal project, actual behavioral change was not measured, but in the Afghanistan project there was a significant change in terms of behavior.

One U.S. project only measured knowledge gained and the results were also positive. In terms of behavioral change, the measure consisted of informal reports from the field workers and the community leaders who were involved in the implementation of the ACT system, and they reported that there was evidence that the ACT system did affect the target audience behavior (Colle, 1973; Colle, 1974).

The ACT pilot program in Bangladesh has a built-in evaluation component to measure knowledge gained, impact on adoption, and

monitor implementation process. The evaluation is based on a "before and after" study for both "treatment" and "control" groups. The evaluation study will be completed by the end of 1983.

Production Requirements

The most important requirement for developing an effective cassette program for the ACT system is to have a good script writer and a producer who can translate motivational and technical information into an attractive and entertaining yet informational and/or instructional program. The agricultural extension workers, or the health field workers, or the family planning workers should supply the writer/producer with the technical information required. Some recording should be done in the area where the cassette program is to be distributed so that local inputs can be used in the program. Final production, editing and reproduction of the cassettes, if necessary, can be done at the provincial level or capital city.

In the Bangladesh ACT project, the scripts are written by agriculture researchers who also record the cassette programs with simple-to-operate cassette recording facilities. The cassettes produced in a non-soundproof studio, while not having a professional quality, are more than satisfactory in terms of sound quality and very little unwanted noise could be recorded (due to the low-cost, thus less sensitive, microphone used for recording). As long as the recording is done in a quiet location, such as an empty classroom, empty office building, etc., the recording quality can be quite good (e.g., the information can be heard clearly), since rural audiences do not expect BBC or VOA, or even Radio Bangladesh, professional standards.

Survival of the Cassette Units

The skepticism and reluctance of some development agencies towards having cassette units left in rural households for fear that the equipment will not be cared for is unfounded. In Colle's words, "it represents an urban elitist bias against rural people." Reports from Guatemala, U.S. and Indonesian projects indicated that equipment lost, stolen, damaged or even seriously marred was minimal. More serious losses occur in administrative offices than in the field.

It is felt that the loss of equipment in a "home information delivery" system would be small because the people handling the equipment and passing it on to others would feel responsible for the equipment. Colle (1973a) hypothesized that as the cassette units and the cassettes

were passed from household to household, they would begin to enter households of higher socio-economic status because people would tend to pick households that were dependable and reliable so that the cassette unit would not be damaged or lost. Apparently some users take care of the equipment as a reaction to being trusted. We have sometimes discovered persons reluctant to take cassette units because they worried about being responsible for damages or losses (Colle, 1976; Stanley, 1980).

Cost

The cost estimate for the use of the ACT system depends on several factors, among others: (1) the type of ACT recording and play-back equipment used, (2) the ratio of play-back units to number of intended audience/listeners, (3) the frequency of cassette production, and (4) the type of power supply used.

ACT production equipment necessary to produce reasonably good quality cassette programs could range from a simple set of equipment (see Annex 4) without a recording studio, consisting of 2 cassette recorders, 1 external microphone and a mono-cassette duplicator (total cost approximately US$1,000) to more complete production system equipment (see Annex 3) with a low-cost soundproof recording studio (total cost approximately US$3,000).

The estimated cost for the Bangladesh project is about US$0.33 per audience for a 60 minute cassette (± 30 minutes of information) based on 272 multiplier agents as primary target audience (Adhikarya, 1982). This cost calculation includes production cost and a thirty-six month depreciation of equipment (25 inexpensive and 8 high quality cassette recorders, 300 blank cassettes, 1 high speed cassette printer/duplicator, 8 external microphones, and 25 motorcycle batteries), and based on a once-a-month production of 60 minute cassettes. Beginning July 1983, the plan is to produce the cassettes *twice* a month, thus reducing the cost per audience by half, to US$0.16 per 60 minute cassette.

It appears that the ACT system's cost per audience for 30 minutes of information, in Bangladesh, is *less* than even the cost of *a poster* (in Bangladesh a 4-color poster of size 20 × 30 inches costs at least Tk.4. — or US$0.17 per poster based on 10,000 copies printed), which obviously contains less information than a cassette.

Based on pilot studies, Colle, Terzuola and Colle (1975a) provide a

conservative cost estimate for the use of the ACT system. They estimated the cost of reaching each farmer in Guatemala to be 2-3 U.S. cents per week for approximately 5 minutes exposure time. This figure is based on depreciating a cassette unit in six months' time. It does not include the production costs involved, something difficult to estimate very accurately for it all depends on local facilities, production format, etc.

The Afghanistan study did not attempt to calculate cost per farmer reached, but did report on the cost of batteries. Fifty-one sets of batteries were used with an average set life of four hours at a local cost of 33.33 Afghanis per set (US$0.35). In effect, it cost 8.33 Afghanis (US$0.09) for batteries to take one hour of information on cassette to 18 farmers (Stockley, 1977).

The cost per audience of the ACT information delivery system is relatively low compared to other information dissemination methods. Moreover, once the ACT system is set up, the process of developing, packaging, producing, and distributing information materials by means of cassettes does not require as much time as compared to other media (e.g., posters, leaflets, booklets, slides, filmstrips, films, etc.).

Power Supply

In some rural areas the availability of batteries is very limited. While it is true that the cost of batteries is minimal (in urban areas), the problem is that of logistics, making them available in rural villages. It is estimated that a set of batteries (4 batteries) can be used for four to eight hours of continuous playback. In order to cope with this problem, several innovative technological alternatives have been attempted.

The Handwind Generator. Gospel Recordings of Hong Kong has come up with a cassette unit which can be operated by several power sources, including one that works by turning a small hand crank on the player. Its cost is about US$20.

Bible Translation of Dallas Texas (USA) recently demonstrated a durable spring-operated cassette player. When fully wound, it will run for 7 to 10 minutes and can be rewound while a cassette is playing. In mid-1983, the organization was arranging for mass production of the units, which will cost about US$80.

Solar Power. Bjorn Berndston, formerly with UNICEF New York,

has designed and produced several solar-powered media, such as Solar Panel Solec I for radio (direct solar power for 9 volt radio), and Solar Panel Solec II which can charge batteries continuously. Even though designed primarily for radio, minor adjustment can easily be made to use the Solar Panels as the power source for cassette players. The price range for the Solar Panel Solec is from US$30 to US$45.

Motorcycle Battery. This type of battery is easily available in many rural areas in most developing countries, due to the increasing popularity of motorcycles among rural people. The cost of a motorcycle battery (e.g., Yuasa) is around US$ 25 to US$ 35. Several advantages of this type of battery are: (1) it is light-weight, (2) it lasts longer (approximately 4 to 5 times) compared to dry-cell/flashlight battery, and (3) it is rechargeable, and the recharging cost is inexpensive (approximately US$ 0.50 to US$ 1).

Another advantage is that in many rural areas, one could often find a place (usually at a market) to recharge car or motorcycle batteries. Apparently, in areas where electricity is not available, car or motorcycle battery is one of the most popular alternative power sources, among many rural people, to operate radio sets, cassette recorders, loudspeakers (as commonly used at the mosques during prayer time in many Muslim countries), and even TV sets.

Some Policy Implications

In rural development programs the most often used method is that of the extension service using interpersonal communication via some kinds of extension agents, field workers, or paraprofessionals to link the development agencies with the rural population. However, there clearly are several major problems in the extension system, including an inadequate supply of extension agents or field workers, a narrow range of extension agents' competence, a lack of quality control, and an inflexibility in the actual communication process. We, therefore, need a simple communication system that can reach more rural people, especially the rural poor, with a greater range of information tailored to local circumstances, while maintaining the integrity of the message and keeping within a limited budget. From the experiences of pilot projects in more than 10 countries it appears that the Audio Cassette Technology systems can meet these needs. Despite questions that still exist, the evidence to date indicates that ACT can stretch scarce manpower resources in rural development communication, greatly assist the field workers and extension agents, and

improve the quality of the extension agents (Colle, Terzuola, Colle, 1975a).

While the effectiveness and promising performance of the ACT system has been demonstrated, the use of this system is still limited to small pilot projects. Rogers and Danziger (1975) pointed out several reasons why the Little Media such as audio cassettes are still underutilized. The first factor is lack of awareness among the development workers and decision makers as well as the majority of communication planners and specialists of the availability, effectiveness, and inexpensiveness of the Little Media. Most of these people tend to use their own "Western-urban" criteria rather than the villagers' criteria of what is an effective medium for rural development.

Another factor is that Little Media are seldom investigated by communication researchers: "Studies of the least complex and least expensive media hardly exist; the more costly and glamourous media draw the lion's share of research funds" (Schramm, 1977).

A third factor that affects the modest use of the Little Media is the negative attitude of many development officials toward simple and unsophisticated technology. It is simply not prestigous, or "modern" enough. The prestige factor also influences many international donor agencies and advisors. Both like to deal with prestigous projects, and the Little Media are not usually viewed in this way (Rogers and Danziger, 1975). In addition, large hardware manufacturers may not yet be sensitive to the potential of the Little Media and their potential role in development. Those manufacturers that are aware know that, whereas the potential market is quite large, the present market is very small. Further, they have had greater success in selling the Big Media (Rogers and Danziger, 1975).

Several suggestions for increasing the use of the Little Media have been made by Rogers and Danziger (1975):

(1) Identify and distribute field experience in which the Little Media are being successfully used.

(2) Identify actual software prototypes and make them available for distribution.

(3) Emphasize that the Little Media allow indigenous production.

(4) Sensitize the hardware manufacturers to the needs and potential market for the Little Media.

(5) Consider cost-effectiveness, not just effectiveness, of the media.

(6) Make funding for the Little Media projects easier to obtain. Some people claim that because the paper work for small budget projects is comparable to big budget projects, donor agencies are more likely to approve Big Media projects than Little Media budgets.

Research Needed

More rigorous evaluation research on the effectiveness of the ACT system in terms of actual behavior change as well as cost are needed. More precise studies on local audience participation in the development and production of the software are also needed. There is also a need to discover more about whether the appeal and power of the ACT system lies partly (or mostly) in its novelty or whether it has durability over a great length of time.

We have touched on a very narrow range of uses of cassettes. We have suggested elsewhere (Colle, 1981) that the use of paraprofessionals can be substantially strengthened through more effective use of communication media as part of their supervision and support systems. Audio cassettes show potential not only in helping paraprofessionals such as community health aides reach their clients, but as a means of giving them in-service training and administrative back-up. We need more information on these possibilities for innovation and substitution for conventional practices which may no longer be affordable.

Audio cassette recorders and tapes are becoming widely available as consumer items. Tapes can be purchased in market places from Cairo to Bali. Tisa (1977) found combination radio/cassette players in most of the villages where he worked in Mali "and a willingness on the part of the villagers to share tapes and machines." Development agencies need to examine the implications and potential of this technology as an information medium, as it gains prominence as an entertainment medium.

Finally, it should be understood that an effective communication strategy for rural development should not only depend on one communication medium, but it should employ a multi-media communication strategy based on a thorough planning and analysis of media availability, effectiveness and cost as well as audience communication patterns and their message acceptability.

APPENDIX 1

Table I: SELECTED RURAL DEVELOPMENT PROJECTS USING ACT SYSTEM

COUNTRY	PROJECT DESCRIPTION	ACT used for:				MAIN SUBJECT MATTER	SOURCES OF REPORT OR EVALUATION
		Listening Groups	Training Field Workers	Field Workers Tool	Home Information Delivery		
India	The Farmers Training and Functional Literacy Project used 1,800 cassette players and 15,000 cassettes to provide insect control and plant diseases information.	X				Agriculture	Colle, 1976
Afghanistan	The General Directorate of Information and Ministry of Agriculture assisted by UN/FAO conducted a radio/cassette/feedback project using 10 cassette recorders and 100 cassettes.		X	X		Agriculture	Stockley, 1977
Nepal	A pilot test was conducted at the Women's Affairs Training Center, – Jawalakhel, on the effectiveness of ACT in training 31 field workers.		X			Family Planning	Shaney, 1973
Guatemala	BVE Project. The Ministry of Education conducted the Basic Village Education Program in which ACT was used in regular farmer listening groups. In addition, cassettes were used by volunteers to provide information to ad hoc audiences. Cassettes were also used to orient leaders of listening groups.	X	X	X	X	Agriculture	Colle, Terzuola, Colle, 1975
Guatemala	The Pila Project provided information to plantation women by putting players in the central places used for laundering clothes.	X				Health Nutrition	Colle and Colle (1978)
Korea	Some Mothers' Clubs in the villages of Korea have been reported to use the ACT system in their family planning communication efforts.	X				Family Planning	Reported in Colle, 1974a
Pakistan	The Family Planning Program used ACT for training of the traditional midwives, DAIS.		X			Family Planning	Roshan, 1980 Reported in Colle, 1975
Indonesia	1. The Directorate General of Transmigration with the assistance of UN/FAO, conducted a pilot project using 35 cassette recorders and 100 cassettes to reach 238 transmigrant families.				X	Nutrition Agriculture	Adhikarya, 1978, 1978a
	2. The Directorate General of Radio, Television and Film has produced about 150,000 cassettes with information on food production, rural cooperatives, agriculture, etc., for dissemination in rural Indonesia.			X	X	Nutrition Cooperatives Agriculture	Kompas daily, 1978

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APPENDIX 1

Table 1 SELECTED RURAL DEVELOPMENT PROJECTS USING ACT SYSTEM

(continued)

COUNTRY	PROJECT DESCRIPTION	ACT used for:				MAIN SUBJECT MATTER	SOURCES OF REPORT OR EVALUATION
		Learning Groups	Training Field Workers	Field Workers Tool	Home Information Delivery		
USA	Cornell University's College of Agriculture and Life Sciences conducted a series of projects on the use of Cassette Special Communication System (CSCS) to provide information to low income people to help them cope with some of their daily living problems, such as, health, nutrition, rent control, etc. Cassettes were used in individual households and in organised groups.	X		X	X	Health Nutrition Housing	Colle, 1973 Travis, et al, 1981
Tanzania	The Audio Cassette Listening Forum Project concentrated on enabling women to recognize the importance of their roi's, and to initiate their own action programs. Cassettes were produced by district officials and local village women.	X					Stanley, n.d.
Bangladesh	ACT pilot program implemented by Bangladesh Agricultural Research Institute (BARI) and the Directorate General of Agriculture Extension with the assistance of FAO project BGD/79/034. Its objective is to facilitate utilization of agricultural research findings by field agricultural extension workers. In addition, feedforward information and feedback information from extension workers is solicited and recorded, then sent to research stations to be used as inputs for the next cassette programs and for identifying future research issues. Cassettes are produced at the regional and district levels. This program started in early 1983.		X			Agriculture	Adhikarya, 1982

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Appendix 2

PROJECT PROFILES

(adapted from Project Profiles, Clearinghouse on Development Communication, Washington, D.C.)

The following project descriptions show how audio cassettes have been used alone and in conjunction with other media.

I. Assistance to Rural Broadcasting, Afghanistan

Target Audience: Farmers in three Afghan provinces (approximately 17,500 people)

Objectives: To improve rural broadcasting as a means of supporting rural development activities and to test the feasibility of establishing in Afghanistan a communication system involving radio, cassettes, and farmers' feedback.

Media: Radio, tape recorders and cassettes, and interpersonal communication.

Description: The project reflected the Afghan Government's desire to keep farmers apprised of improvements in agriculture and livestock-production techniques and to make them aware of the existence and availability of credit, equitable means of distributing irrigation water, and the possibility of forming farmers' cooperatives. By the time the political and logistical obstacles to implementation had dissolved (1976) the project had acquired a second dimension—that of a communication support system for the national land reform then in progress.

Abandoning early plans to establish and then to test the feasibility of a rural radio forum in Afghanistan, the project directors decided that a communication system involving radio, cassettes, and farmers' feedback would meet local needs better than the conventional radio forum could. Accordingly, tape recorders and one hundred tapes were purchased, and a survey aimed at determining the kinds of information that farmers wanted and could use was carried out. In December 1976, tapes produced on the basis of the survey findings were circulated in two provinces.

The radio component of the communication system was already well established in the project area when the project began. Radio ownership in rural Afghanistan is high and the Ministry of Agriculture's Department of Extension and Development has been contributing 20 minutes of programming to the nightly broadcast of "Village, Home and Agriculture."

Fifty-six extension agents from eight extension units were selected to participate in the project. After being briefed and receiving radios, these agents conducted the 16 meetings that served as the pre-project survey and visited villages on Wednesdays (when "Village, Home and Agriculture" was broadcast) to drum up interest in the radio broadcasts, to distribute cassettes, and to solicit farmers' requests, criticisms, questions, and comments.

Results: Records kept by the extension agents show that 3,883 of the roughly 17,500 farmers in the target area had heard at least one tape. In contrast, two out of every three farmers in the area had heard programs on the national land reform, and four our of five of those who heard the message felt that all their questions had been answered satisfactorily.

The spread of ideas proved easier to trace than the spread of improved agricultural practices. Moreover, little effort was made to measure changes in farming techniques since the project resources were limited. Research did, however, establish that farmers in the experiment acquired information that they considered useful, tended to value cassette-carried (as opposed to that passed from farmer to farmer) information more as they grew accustomed to the medium. The evaluation survey also showed that half the farmers who had heard the tapes listened regularly to the radio broadcast, compared with three in ten of those who had not heard the tapes.

Special Notes: The pre-broadcast survey revealed that farmers tended to be interested in topics that are seasonal, local, and related to decisions they have to make. Specifically, the cassettes carried information on the control of rye grass in wheat, of rust and smut in wheat, on the pruning of fruit tress, and on the control of field mice.

Post-project research indicated that receptivity to the broadcast and taped messages had nothing to do with a farmer's age and that level of education correlated with willingness to try a new practice with respect to only one of the five variables measured.

II. Radio Mensaje, Ecuador

Target Audience: Rural Ecuadorian adults

Objective: To teach illiterate rural adults with educational radio programming devised by and for their peers.

Media: Radio and cassette recorders.

Description: Campesino-produced cassette programs were introduced into the broadcasts of a small regional station, Radio Mensaje, in late 1972 as an attempt to reach a high proportion of the estimated 44,000 illiterate adults in the vicinity of Tabacundo, Ecuador. The project was designed to win over a mass audience through open broadcasting and to make the listeners themselves the programmers and the broadcasters. Its immediate objectives were to see whether radio programming without sophisticated formats, education accents, etc., would still interest audiences, and at the same time to broadcast community-generated content in the vernacular. Its long-range goals were (1) to heighten the listeners' feelings of self-worth, (2) to further community development and (3) to upgrade the listeners' literacy and numeracy skills.

The project secured 40 audio cassette recorders and many tapes. This equipment was then parcelled out and made familiar to the unpaid teaching assistants in the area's 40 radio school centers. Each auxiliar used this equipment to record tapes that are aired on two half-hour programs each week.

The Mensaje Campesino (The Farmer's Message) broadcasts reflect the idea that farmers are so interested in hearing themselves on the radio that home-made programming can attract a wide audience. While the auxiliares take charge of recording the tapes and of delivering them to the stations, the broadcasts are no longer even edited, much less put in a set format. The programs contain advice, poems, songs, scripture readings, dramatizations of community problems, testimonials, reading and math lessons (broadcast in conjunction with a pre-existing radio-education program), and exhortations.

Special Notes: Left on their own after receiving half-hour briefings on how to operate the tape-recorders, the auxiliares quickly came to terms with the equipment and used it carefully and creatively.

One participating rural group without its own tape recorder rented a

car to take it to the radio station's studio so its members could give a "live performance."

The highly technical remarks of one well-intending but out-of-touch agronomist were "translated" by a campesino into an easily comprehended style.

One community taped the speech of a development-program official and kept the tape as a lasting record of his promises to the people.

III. Kipsigis Homesteads Cattle-dip Management Program, Kenya

Target Audience: Maneret dairy farmers near Sotik and Kipsigis (about 200 in all)

Objectives: To use small media to provide cattle-raisers with educational and motivational information related to a tick-eradication program.

Media: Cassette tape recorders, posters, photoessays, photographs, film, print, and interpersonal communication.

Description: The U.S. Peace Corps began the Kipsigis Homesteads Cattle-Dip Managements Program in 1970 to make headway against the fatal strains of tick-borne cattle diseases so widespread in Kenya. The adult-education component of the project was later revised and expanded when it became apparent that the project had gone awry. Additional educational activities were needed because many of the local farmers clearly did not understand how dipping cattle controls ticks or why dipping cannot work unless it is done regularly. Some farmers did not dip any of their cattle, some did so in a hit-and-miss fashion, and some dipped only their upgraded animals, leaving the indigenous Zebu stock open to tick attacks. At the same time, the dipping facilities were not being maintained properly, and the Kipsigis Cooperative's management was not obtaining enough chemical concentrate to keep the dipping solution at the necessary strength.

Discussions with farmers and local veterinary workers confirmed the assumption that the farmers did not understand how dipping cattle controls ticks. They also revealed that farmers who did grasp the relationship were reluctant to pay dipping fees when the chemical solution was too weak to be effective. While veterinary extension

workers had tried to remedy these problems by consulting with groups of farmers and with members of the Cooperative management, their lack of experience with nonformal adult-education approaches fitted them to do little more than chide uncooperative cattle farmers.

To fill this information gap, two Peace Corps volunteers worked with the veterinary extension agents to develop photobooklets (with Swahili captions and an accompanying taped narration in the local language), three-dimensional demonstration models, and other audiovisual aids for use at the dipping facilities and in farmers' meetings and Cooperative Committee sessions.

Care is exercised in all these learning activities to involve the Wazee (or "venerable elders"). These older farmers are called upon to tell of bygone animal-husbandry practices, and their stories prompt the other farmers to reflect upon changes (such as the introduction of graded animals) and their implications. All the farmers in the groups are free to ask and answer questions and to share information. Outside resource people participate in these discussions, too, but they take pains to refrain from introducing new information until the local people are ready and able to use it.

Outside of the meetings, the primary medium is the audio cassette recorder. Use of the recorder enables project workers to obtain farmers' reactions to the educational activities, to share the proceedings of these meetings with farmers unable to attend, and to record oral history related to agriculture.

Results: Through discussion, solutions that incorporated both knowledge within the community and new information relevant to the farmers' needs and situations were developed.

Management of the dips became more efficient, a greater emphasis was placed upon maintaining the correct chemical concentration in the dip tanks, an improved system of record-keeping was devised and put to use, and much-needed repairs to the dipping facilities were made. Many farmers began dipping all their cattle regularly, as well as adopting other improved animal-husbandry practices. As a result of these changes, veterinary records show cattle deaths due to tick-borne diseases decreased substantially once the communication component of the project was functioning.

Special Notes: Language problems and production difficulties have limited the effectiveness of 16mm film in this project.

Slides are displayed outdoors in plastic folders in the daylight, so projectors and darkened rooms are not essential to the program.

Secondary-school students in Kipsigis listen to the tapes and look at the photoessays made for the Manaret farmers. This way, the two age and social groups keep in touch.

IV. The Pila Project, Guatemala

Target Audience: Working women on a Guatemalan plantation.

Objective: To teach women basic ways of improving nutrition and health at home.

Media: Audio-cassettes

Description: A three-week experiment was conducted on a coffee plantation to examine ways of getting basic information on health and nutrition to households on Guatemalan plantations.

It was decided to direct the campaign at women because they generally make the basic decisions on food and hygienic practices in the Guatemalan household. Preliminary study showed that the plantation's women worked almost continuously during their waking hours. The project therefore focused on the pilas (community laundry centers) as places where women could learn informally without disrupting their work.

Audio-cassettes were chosen as the medium because they cost little, are simple to operate, and can be played at any time. Non-professional actors were engaged to produce 30-minute programs combining health information, music, radio novellas, and miscellaneous spot announcements. Programming was deliberately repetitious, so that women passing in and out of the pilas would be likely to hear and retain specific messages. Successive days' programs often expanded on themes of preceding days. In addition, some programs promised material rewards (such as baby chicks) to women who memorized certain lessons.

A local teenager handled distribution, taking cassettes to the pilas daily, and supervising their use. She adjusted the playing schedule

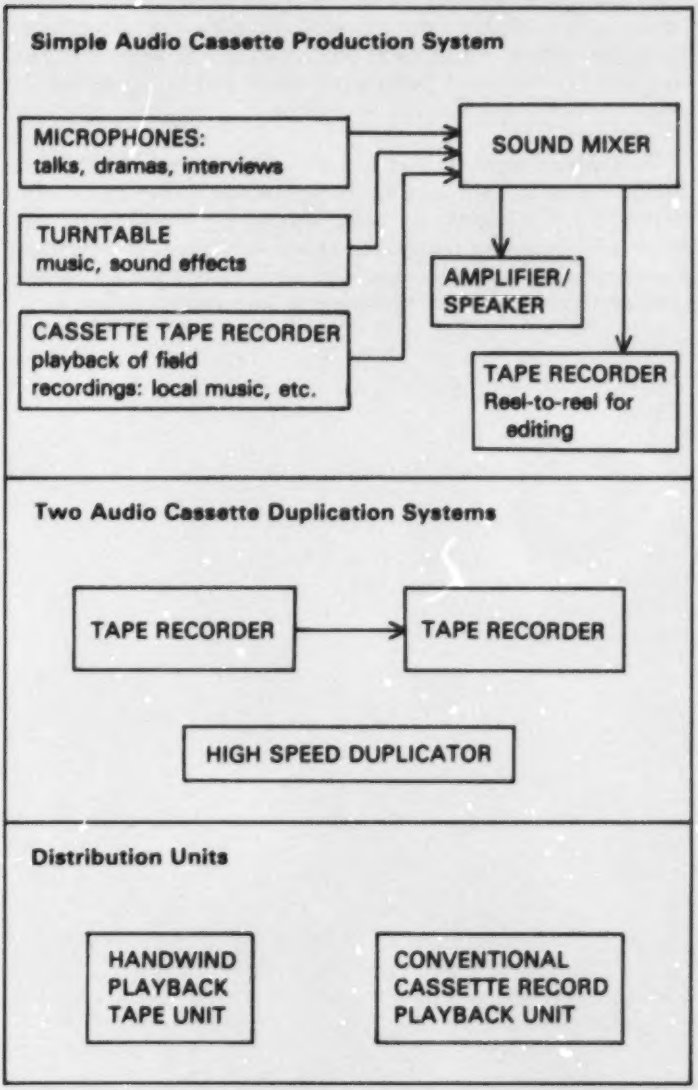
according to when women were present. Other cassettes were distributed for at-home listening using a tape player borrowed from the plantation office.

According to a follow-up survey, the plantation women enjoyed the tapes, found specific information useful, and were disappointed when the project ended. When asked which part of the tapes they liked best, women mentioned "advice" on health and nutritional matters far more often than the music or novellas.

The program demonstrated that the audio-cassette medium was flexible enough to reach large numbers of women. When the women's working hours changed, the tapes were simply played at different times. The equipment proved appropriate to the task and no breakdowns occurred. Nonprofessional actors and technicians were able to produce quality programming using only inexpensive equipment.

Appendix 3

EQUIPMENT FOR AUDIO CASSETTE PROJECTS



Representative Equipment Costs

The cost of the items which appear in the diagrams on the preceding page will differ according to place of purchase. The data below indicate approximate costs in $US and are based on information from accessible suppliers in the United States, Hong Kong and the South Pacific, data provided in UNICEF's **Audio Visual and Reprographic Equipment Planning Guide** (November 1981), and equipment lists drawn up by development agencies for special projects.

Item	Cost
Microphones	US$ 50 - 90
Turntable (disc player)	100
Cassette-tape recorder (for production use)	100 - 275
Amplifier/speaker system	100 - 250
Sound mixer	250
Tape recorder, reel-to-reel	500 - 870
Cassette duplicators	230 - 1000
Cassette players (handwound)	20
Cassette recorders/players (consumer models for field use)	25 - 35
Cassette tapes (30 minutes each side: C-60)	1 - 1.25
Miscellaneous items, including tape splicers, microphone stands, connecting cables, etc.	100

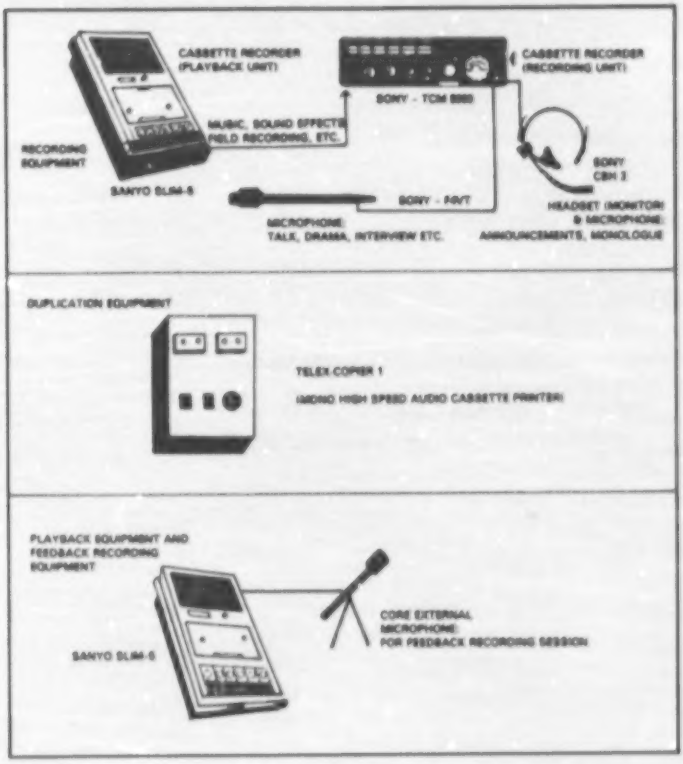
Facilities:

Some projects will have the luxury of using recording studios; however, lack of these facilities should not inhibit project leaders. Schools, religious buildings and the outdoors have served effectively for many recording sessions around the world.

Appendix 4

SIMPLE AUDIO CASSETTE RECORDING EQUIPMENT

(as used in the FAO Project BGD/79/034 supported ACT pilot project in Bangladesh)


CASSETTE RECORDER (PLAYBACK UNIT)
CASSETTE RECORDER (RECORDING UNIT)
SONY - TCM 5000
MUSIC, SOUND EFFECTS FIELD RECORDING, ETC.
RECORDING EQUIPMENT
SANYO SLM-6
SONY - F6VT
SONY CBH 3
HEADSET (MONITOR) & MICROPHONE: ANNOUNCEMENTS, MONOLOGUE
MICROPHONE: TALK, DRAMA, INTERVIEW ETC.
DUPLICATION EQUIPMENT
TELEX COPIER 1
(MONO HIGH SPEED AUDIO CASSETTE PRINTER)
PLAYBACK EQUIPMENT AND FEEDBACK RECORDING EQUIPMENT
SANYO SLM-6
CORE EXTERNAL MICROPHONE FOR FEEDBACK RECORDING SESSION

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